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## IMAGING AND DIAGNOSTIC TESTING

### TWO-DIMENSIONAL SPECKLE STRAIN IMAGING IDENTIFIES DEPRESSED LEFT ATRIAL FUNCTION IN HYPERTENSIVE PATIENTS WITH DIASTOLIC DYSFUNCTION

ACC Oral Contributions

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Session Title: Tissue Imaging: Clinical Impact of Novel Imaging Approaches to Quantify Cardiac Function

Abstract Category: Tissue Imaging

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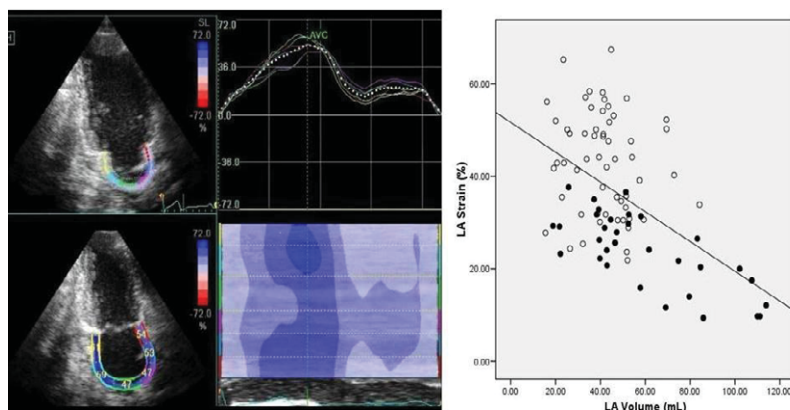
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**Background:** 2D Speckle Strain Imaging (2DSI) is a novel method for assessment of left atrial (LA) expansion (strain) during ventricular systole, and may give insight into LA mechanics. We used 2DSI to analyze LA function in diastolic dysfunction (DD) pts and healthy volunteers (NLS), hypothesizing that abnormalities in LA strain are part of the pathogenesis of DD.

**Methods:** 39 pts with Grade1-2 DD ( $76 \pm 14$  years; 72% women) and 66 NLS ( $44 \pm 16$  years; 55% women) underwent echocardiography and LA 2DSI. LA volume was calculated by the area-length method, and the ratio of  $E/e'$  to atrial strain used as an index of LA stiffness.

**Results:** In analysis of covariance, adjusting for age and gender, DD had lower  $E/A$ , higher  $E/e'$ , greater LA volume (both  $p < 0.01$ ) and lower LA strain ( $24 \pm 8\%$  vs  $43 \pm 11\%$ ;  $p < 0.001$ ); DD showed a parallel, marked increase in LA stiffness ( $0.52 \pm 0.09$  vs  $0.21 \pm 0.11$ ;  $p < 0.001$ ). As shown below, LA strain was inversely related to LA volume ( $p < 0.001$ ;  $r = -0.51$ ); however LA strain was not related to indices of LV diastolic function-- $e'$  or  $E/A$  ratio. In a subgroup analysis of 14 DD patients, age and gender matched with 14 NLS controls, both LA strain and stiffness were significantly impaired in DD, even after correction for differences in LA volume and  $E/A$  ratio.

**Conclusion:** LA strain by 2DSI is significantly reduced in DD and is related to higher LA stiffness and LA size. However, in DD, the reduction in LA strain is at least partially independent of LA volume and might represent an early marker of impaired atrial distensibility.



**Graph.** Left Panel: Left atrial 2DSI; Right Panel: Correlation between LA volume and LA strain by 2DSI in diastolic dysfunction (solid circles) and normals (open circles)